FEDERAL AID
ANNUAL RESEARCH PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

PROJECT TITLE: Ecological studies of the Kenai Peninsula brown bear

PRINCIPAL INVESTIGATOR: Sean Farley

COOPERATORS: Kenai National Wildlife Refuge, United States Fish and Wildlife Service, U.S. Dept. of Interior; Chugach National Forest, U. S. Forest Service, U.S. Department of Agriculture; Kenai Fjords National Park, National Park Service, U.S. Department of Interior

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NR: W-33-2

PROJECT NR: 4.29

WORK LOCATION: Kenai Peninsula

STATE: Alaska

PERIOD: 1 July 2003–30 June 2004

I. PROGRESS ON PROJECT OBJECTIVES SINCE PROJECT INCEPTION

OBJECTIVE 1: Assess survivorship and recruitment to evaluate perceived population trends seen in recapture data.

Three new female bears and one male bears were added to the Kenai database in the fall/spring 2003-2004. We have 18 female bears on the air. Telemetry flights are continuing to determine cub production and survivorship, but data analyses are not complete at this time.

OBJECTIVE 2: Determine if Kenai brown bears represent a population exhibiting large litter sizes and early weaning.

Data analyses are not complete.

OBJECTIVE 3: Measure the degree of heterozygosity seen in the Kenai brown bears, and calculate an "effective population size" (N_e).

We have submitted a manuscript for publication. Our calculations for a breeding bottleneck were conducted with an effective population size of 25% of the lower size estimate (25% of 140 = 35 $N_{e)}$. This N_e did not show evidence of a recent severe bottleneck on the Kenai Peninsula based on heterozygosity excess.

OBJECTIVE 4: Assess habitat use, identify key travel corridors, and quantify the nutritional resource needs of adult male brown bears.

Only one male was handled this year. This objective must be revised.

OBJECTIVE 5: Experimentally evaluate if the management concept of "buffers" has biological relevance to Kenai brown bears.

No work has been accomplished on this objective.

OBJECTIVE 6: Continue to evaluate and refine the cumulative effects model.

The USFS is continuing refinement of the RSF functions. We have prepared a draft manuscript on bear highway crossings and we are in the final stages of preparing a manuscript on the habitat use by Kenai brown bears.

OBJECTIVE 7: Develop and apply new technologies (e.g., video collars, triaxial accelerometers) to ecological studies of bears.

No further work was performed in this area.

OBJECTIVE 8: Determine if the geographic range of Kenai Peninsula brown bears extends into Prince William Sound.

Additional hair snares were established in Kenai Fjords National Park by Park personnel. We performed preliminary DNA analysis on these hair and scat samples.

OBJECTIVE 9: Continue publication and report writing.

Work is continuing.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD D. JOBS (related Objectives indicated in parentheses)

Job 1: Assess population trend from additional data on population age structure, adult and offspring survival, and offspring recruitment. Information will be collected in the course of radiocollaring across the peninsula (1,2)

Five bears were captured in fall 2003 (5 female, one new). Eight bears were captured in spring 2004 (7 female; 1 male; 2 new females; 1 new male). There were no capture-related mortalities. In spring 2004 21 coy were produced in 11 litters, but by 1 July 7 coy in 3 litters

had unknown fates, 5 coy in 3 litters were known alive, and the remaining 9 coy in 5 litters were missing and assumed dead. 5 yearlings (in two litters) were still alive by 1 July 04.

Job 2: Use biological samples (blood and tissue) collected from radio-collared and sealed bears for mitochondrial and microsatellite analyses.

Manuscript on this completed work is in draft form.

Job 3: Specifically capture adult male brown bears for radiocollaring and biological sample collection. Employ new technology (remote release Global Positioning System (GPS), video, and tri-axial accelerometer collars, stable isotope and fatty acid signatures, and total body water dilution to better assess the nutritional ecology (e.g. seasonal diet and changes in body composition) of adult male brown bears (1,3,4,7).

The collaring of large adult male brown bears continues to be problematic, and we only handled one male incidental to handling breeding female.

Job 4: Conduct snaring in areas critical to management, but impossible to work by air (5).

No additional snaring was conducted.

Job 5: Develop algorithms to simulate the assumed biological basis of "buffers", utilizing extensive location data collected by GPS collars. Attempt to conduct controlled field experiment to test assumptions, using radio-collar animals in areas with known timber (5).

No work was accomplished on this job this year.

Job 6: Continue to map brown bear locations collected via aerial telemetry and GPS collars for identification of habitat use, peninsula-wide species range, and discrete travel corridors (6)

We have written a draft manuscript detailing analyses to date. In addition, we began development of analytical approach to identify travel corridors used by bears. Contract work continues on that and a manuscript/report will be completed by March 2005.

Job 7: Incorporate the soon-to-be-released Peninsula vegetation map for testing and refinement of the cumulative effects model (6).

A manuscript is in draft form.

Job 8: Collect scat samples from select salmon streams on the Peninsula's east coast; use DNA-based techniques to determine if the samples are black or brown bear in origin (8).

We analyzed 198 samples; 161 were black bears, 25 unknown, and 12 were from brown bears. Additional lab work will be performed to individually identify brown bear samples.

Job 9: Preparation of reports and technical publications (9).

Work continues on this job.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD:

IV. PUBLICATIONS

V. RECOMMENDATIONS FOR THIS PROJECT

VI. APPENDIX

VII. PROJECT COSTS FOR THIS SEGMENT PERIOD

FEDERAL AID SHARE $83,475 + STATE SHARE $ 27,825 = TOTAL $111,300

VIII. PREPARED BY:

Sean Farley
Wildlife Biologist III

SUBMITTED BY:

Research Coordinator

Earl Becker

APPROVED BY:

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Thomas W. Paul, Federal Aid Coordinator
Division of Wildlife Conservation

_____
Matthew H. Robus, Director
Division of Wildlife Conservation

APPROVAL DATE: _____